

CLAIMS

1. Tyre for vehicle wheels comprising at least one structural element made of a crosslinked elastomeric material, in which said crosslinked elastomeric material includes an elastomeric composition comprising:
  - (a) at least one diene elastomeric polymer;
  - (b) at least one paraffin wax;
  - (c) at least one polymer of at least one C<sub>3</sub>-C<sub>24</sub> α-olefin, said polymer having a number average molecular weight not higher than 10,000.
2. Tyre according to claim 1, comprising:
  - a carcass structure with at least one carcass ply shaped in a substantially toroidal configuration, the opposite lateral edges of which are associated with respective right-hand and left-hand bead wires, each bead wire being enclosed in a respective bead;
  - a belt structure comprising at least one belt strip applied in a circumferentially external position relative to said carcass structure;
  - a tread band superimposed circumferentially on said belt structure;
  - a pair of sidewalls applied laterally on opposite sides relative to said carcass structure;

in which said pair of sidewalls is formed by said elastomeric composition.
3. Tyre according to claims 1 or 2, in which the polymer (c) is a polymer of at least one C<sub>5</sub>-C<sub>18</sub> α-olefin.
4. Tyre according to any one of the preceding claims, in which the polymer (c) has a number average molecular weight not higher than about 5,000.
5. Tyre according to claim 4, in which the polymer (c) has a number average molecular weight not higher than about 3,000.
- 35 6. Tyre according to any one of the preceding claims, in which the polymer (c) has a number average molecular weight of at least about 300.

7. Tyre according to claim 6, in which the polymer (c) has a number average molecular weight of at least about 400.
8. Tyre according to claim 7, in which the polymer (c) has a number average molecular weight of at least about 500.
- 5 9. Tyre according to any one of the preceding claims, in which the polymer (c) has a polydispersity value of at least about 2.
10. Tyre according to claim 9, in which the polymer (c) has a polydispersity value not higher than about 20.
- 10 11. Tyre according to claim 10, in which the polymer (c) has a polydispersity value not higher than about 12.
12. Tyre according to any one of the preceding claims, in which the polymer (c) has a melting point or a softening point of at least about 30°C.
- 15 13. Tyre according to any one of the preceding claims, in which the polymer (c) has a melting point or a softening point not higher than about 120°C.
14. Tyre according to any one of the preceding claims, in which the polymer (c) has the following degree of branching: from 1 mol% to 20 mol% of methyl groups with respect to the total number of carbon atoms.
- 20 15. Tyre according to claim 14, in which the polymer (c) has the following degree of branching: from 2 mol% to 10 mol% of methyl groups with respect to the total number of carbon atoms.
- 25 16. Tyre according to any one of the preceding claims, in which the polymer (c) has the following degree of branching: from 80 mol% to 99 mol% of methylene groups (secondary carbon atoms) with respect to the total number of carbon atoms.
- 30 17. Tyre according to claim 16, in which the polymer (c) has the following degree of branching: from 90 mol% to 95 mol% of methylene groups (secondary carbon atoms) with respect to the total number of carbon atoms.
- 35 18. Tyre according to any one of the preceding claims, in which the polymer (c) has the following degree of

- branching: from 1 mol% to 20 mol% of tertiary carbon atoms with respect to the total number of carbon atoms.
19. Tyre according to claim 18, in which the polymer (c) has the following degree of branching: from 2 mol% to 10 mol% of tertiary carbon atoms with respect to the total number of carbon atoms.
- 5 20. Tyre according to any one of the preceding claims, in which the polymer (c) has the following degree of branching: from 0 mol% to 2 mol% of quaternary carbon atoms with respect to the total number of carbon atoms.
- 10 21. Tyre according to claim 20, in which the polymer (c) has the following degree of branching: from 0 mol% to 1 mol% of quaternary carbon atoms with respect to the total number of carbon atoms.
- 15 22. Tyre according to any one of the preceding claims, in which the polymer (c) has a crystallinity degree of from 30% to 99%.
23. Tyre according to claim 22, in which the polymer (c) has a crystallinity degree of from 50% to 90%.
- 20 24. Tyre according to any one of the preceding claim, wherein the polymer (c) is saturated or unsaturated and comprise cyclic moieties.
- 25 25. Tyre according to any one of the preceding claim, wherein the polymer (c) comprises cyclic moieties.
26. Tyre according to any one of the preceding claims, in which the polymer (c) is present in the elastomeric composition in an amount of from 0.1% to 10% by weight with respect to the weight of the paraffin wax (b).
- 30 27. Tyre according to claim 26, in which the polymer (c) is present in the elastomeric composition in an amount of from 0.5% to 5% by weight with respect to the weight of the paraffin wax (b).
28. Tyre according to any one of the preceding claims, in which the paraffin wax (b) is selected from waxes which comprise both linear saturated hydrocarbons and/or branched saturated hydrocarbons.
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29. Tyre according to claim 28, in which the paraffin wax (b) comprises a mixture of linear and branched saturated hydrocarbons, in which the content of linear saturated hydrocarbon is at least 40% by weight.
- 5 30. Tyre according to claim 29, in which the content of linear saturated hydrocarbon is of from 55% by weight to 80% by weight.
- 10 31. Tyre according to any one of claims 28 to 30, in which the linear saturated hydrocarbon has the following compositions:
  - at least from 20 to 29 carbon atoms in an amount of from 10% by weight to 40% by weight;
  - at least from 30 to 35 carbon atoms in an amount of from 20% by weight to 65% by weight;
  - 15 - at least from 36 to 42 carbon atoms in an amount of from 10% by weight to 50% by weight.
32. Tyre according to any one of the preceding claims, in which the paraffin wax (b) is present in the elastomeric composition in an amount of from 0.5 phr to 10 phr.
- 20 33. Tyre according to claim 32, in which the paraffin wax (b) is present in the elastomeric composition in an amount of from 1.5 phr to 4 phr.
34. Tyre according to any one of the preceding claims, in which the diene elastomeric polymer (a) has a glass transition temperature ( $T_g$ ) below 20°C.
- 25 35. Tyre according to claim 34, in which the diene elastomeric polymer (a) is selected from: cis-1,4-polyisoprene, 3,4-polyisoprene, polybutadiene, optionally halogenated isoprene/isobutene copolymers,
- 30 30 1,3-butadiene/acrylonitrile copolymers, styrene/1,3-butadiene copolymers, styrene/isoprene/1,3-butadiene copolymers, styrene/1,3-butadiene/acrylonitrile copolymers, or mixtures thereof.
- 35 36. Tyre according to any one of the preceding claims, in which the elastomeric composition comprises at least one elastomeric polymer of one or more monoolefins with an olefinic comonomer or derivatives thereof (a').

37. Tyre according to claim 36, in which the elastomeric polymer (a') is selected from: ethylene/propylene copolymers (EPR) or ethylene/propylene/diene copolymers (EPDM); polyisobutene; butyl rubbers; halobutyl rubbers; or mixtures thereof.
- 5 38. Tyre according to any one of the preceding claims, in which at least one reinforcing filler is present, in an amount of between 0.1 phr and 120 phr, in the elastomeric composition.
- 10 39. Tyre according to claim 38, in which the reinforcing filler is carbon black.
40. Tyre according to claim 38, in which the reinforcing filler is silica.
- 15 41. Elastomeric composition comprising:
  - (a) at least one diene elastomeric polymer;
  - (b) at least one paraffin wax;
  - (c) at least one polymer of at least one C<sub>3</sub>-C<sub>24</sub> α-olefin, said polymer having a number average molecular weight not higher than 10,000.
- 20 42. Elastomeric composition according to claim 41, in which the diene elastomeric polymer (a) is defined according to any one of claims 34 to 37.
43. Elastomeric composition according to claims 41 or 42, in which the paraffin wax (b) is defined according to any 25 one of claims 28 to 33.
44. Elastomeric composition according to any one of claims 41 to 43, in which the polymer (c) is defined according to any one of claims 3 to 27.
45. Elastomeric composition according to any one of claims 30 41 to 44, in which at least one reinforcing filler is present, in an amount of between 0.1 phr and 120 phr.
46. Elastomeric composition according to claim 45, in which the reinforcing filler is defined according to claim 39 or 40.
- 35 47. Crosslinked elastomeric manufactured product obtained by crosslinking an elastomeric composition defined according to any one of claims 41 to 46.